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ABSTRACT

Data from a Class Activities Questionnaire was used in the evaluation of the state gifted program in Illinois to determine patterns of cognitive and affective emphasis in gifted and average classes. Significant differences were found in the degree of emphasis on higher thought processes, classroom focus, and classroom climate. Significant differences were also found between average and gifted classes on two statistical factors: application, synthesis, enthusiasm, and independence; and memory and test/grade stress. Differences were: average classes emphasized two or less thought processes, while gifted classes emphasized three or more; average classes emphasized only one higher thought process, while gifted classes emphasized two or more; average classes emphasized three of seven levels of thinking, while gifted classes emphasized six of seven; average classes had a higher amount of teacher talk; average classes had little chance for discussion, while gifted classes had much; test/grade stress was characteristic of average classes and not characteristic of gifted classes; average classes revealed an absence of enthusiasm, while gifted classes revealed an abundance; and average classes allowed independence in a fourth of the classes, while gifted classes allowed independence most of the time. (CB)

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PATTERNS OF COGNITIVE AND AFFECTIVE EMPHASIS IN GIFTED AND AVERAGE CLASSES

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PATTERNS OF COGNITIVE AND AFFECTIVE EMPHASIS IN GIFTED AND AVERAGE CLASSES

As part of a large-scale evaluation of the state gifted program in Illinois, the systematic processing of low-inference student judgments about their classes was used to describe and evaluate classroom transactions. The purpose of this study was to determine 1) What cognitive and affective emphases exist in the classroom, and 2) What patterns differentiate "gifted" and "average" classes?

The sample used for this study consisted of 131 Illinois classes in language arts, science, math, and social studies, grades 6 to 12; 3138 students completed the CAQ. One group of 62 classes were "gifted" classes as identified by their school district. This sample was further divided into 28 "reimbursement" classes (in districts receiving money from the state to operate a gifted program) and 34 "demonstration" classes (in districts selected by the state to demonstrate exemplary gifted programs). A group of 69 "average" classes was taken as a comparison group with care not to include any below average classes. A separate study had shown that gifted and average students do not respond differently to the CAQ (see Hession paper). The average sample was drawn from three Chicago suburban districts -- mainly white, middle-class, socio-economically average -- and does not purport to be representative of all classes in the state. An analysis of variance revealed no differences between the average schools in CAQ scores.

Comparisons Between Gifted and Average Classes

How do gifted classes in Demonstration Centers and Reimbursement Projects differ from average classes (classes not designated as honors or gifted)? To determine whether differences exist, these three groups of classes were compared on summary subscores based on the four major dimensions of the CAQ:

1) Lower Thought Processes

2) Higher Thought Processes

3) Classroom Focus

4) Classroom Climate

Table 1 shows the differences revealed by this comparison. (Tables 2 and 3 give the ANOVA and t-test values on which these results are based.) Both Reimbursement and Demonstration gifted classes place significantly more emphasis on higher thought processes, classroom focus, and classroom climate. The degree of emphasis given by average classes on these three dimensions is very low. The two groups of gifted classes differed only in the degree to which they emphasized positive classroom focus -- active student involvement in class activities with reduced pressure on tests and grades. Demonstration classes had significantly more positive conditions in this dimension than either Reimbursement or Average classes. In fact the degree of positive emphasis in the latter two is low, with the trend in Average classes being toward a negative classroom focus -- the teacher lecturing and being the central figure with little student discussion and much test/grade pressure.

It is clear from Table 1 that average classes as a group place little emphasis on any of the four dimensions of instructional climate measured by the CAQ. In contrast both groups of gifted classes differ strikingly

TABLE 1

DIFFERENCES IN INSTRUCTIONAL CLIMATE IN GIFTED AND NON-GIFTED CLASSROOMS IN ILLINOIS

(Tests of significance of differences are based on Analysis of Variance and t-tests. All but one of the significant differences exceed the .01 level of confidence. See Table 2 for F tests and Table 3 for t-tests).

Dimensions of the Class Activities Questionnaire	Comparison Sample of Average Classrooms N = 69	Reimbursement Sample of Gifted Classrooms N = 28	Demonstration Sample of Gifted Classrooms N = 34
LOWER LEVEL THINKING ABILITIES	2.238* Some emphasis	2.170 Some emphasis	2.169 Some emphasis
HIGHER LEVEL THINKING ABILITIES	2.352 No emphasis	2.069 Some emphasis (Significantly greater than Comparison Group)	2.025 Some emphasis (Significantly greater than Comparison Group)
POSITIVE CLASSROOM FOCUS	2.612 No emphasis	2.304 No emphasis (Significantly greater than Comparison Group)	2.127 Some emphasis (Significantly greater than both the Comparison and Reimbursement Groups
POSITIVE CLASSROOM CLIMATE	2.319 No emphasis	1.941 Much emphasis (Significantly greater than the Comparison Group)	1.919 Much emphasis (Significantly greater than Comparison Group)

*The value shown in each cell is the mean score for the group. A mean under 2.25 indicates some emphasis and under 2.00 much emphasis on the dimension concerned.

**Both Reimbursement and Demonstration classes show almost equal emphasis on both higher and lower level thinking abilities, while Comparison classes show less emphasis on lower thinking abilities and no emphasis on higher levels.

TABLE 2

ANALYSES OF VARIANCE FOR FOUR DIMENSIONS

Lower Thought Processes Subscore

Source	df	SS	MS	F ratio
Between	2	.14	.07	2.44*
Within	128	3.66	.03	
Total	130	3.80		

*p > .05 (Not Significant)

Higher Thought Processes Subscore

Source	df	SS	MS	F ratio
Between	2	2.68	1.34	40.29**
Within	128	4.26	.03	
Total	130	6.95		

**p < .001

Classroom Focus Subscore

Source	df	SS	MS	F ratio
Between	2	6.03	3.02	37.52**
Within	128	10.29	.08	
Total	130	16.32		

**p < .001

Classroom Climate Subscore

Source	df	SS	MS	F ratio
Between	2	4.40	2.20	31.64**
Within	128	8.90	.07	
Total	130	13.30		

**p < .001

TABLE 3

VALUES OF STUDENT'S t COMPARING DIFFERENCES BETWEEN MEANS FOR THE AVERAGE AND GIFTED SAMPLES ON EACH OF THE FOUR CAQ SUBSCORES

Comparisons	df	Mean	SD	Difference Between Means	t
SUBSCORE 1: LOWER THOUGHT PROCESSES					
Average & Reimbursement	95	2.223	.177	.053	1.384
Average & Demonstration	101	2.214	.157	.073	2.019*
Reimbursement & Demonstration	60	2.174	.163	.020	.482
SUBSCORE 2: HIGHER THOUGHT PROCESSES					
Average & Reimbursement	95	2.276	.188	.264	6.643***
Average & Demonstration	101	2.252	.145	.303	7.570***
Reimbursement & Demonstration	60	2.067	.197	.040	.885
SUBSCORE 3: CLASSROOM FOCUS					
Average & Reimbursement	95	2.524	.265	.304	4.593***
Average & Demonstration	101	2.449	.365	.495	9.186***
Reimbursement & Demonstration	60	2.203	.242	.190	2.454**
SUBSCORE 4: CLASSROOM CLIMATE					
Average & Reimbursement	95	2.212	.273	.370	6.054***
Average & Demonstration	101	2.198	.273	.365	6.662***
Reimbursement & Demonstration	60	1.952	.236	.006	.085

*$p < .05$, however ANOVA for Subscore 1 was not significant.

**$p < .02$

***$p < .001$

from the Average classes sampled here. Gifted classes emphasize most or all of the four dimensions measured.

Within the gifted groups demonstration classes are superior to reimbursement classes in only one dimension -- classroom focus. This dimension has been most emphasized in the selection and training of demonstration personnel. That is, classroom focus has been away from the teacher lecturing and being the central figure with little student discussion and much test/grade stress. Also worth mention is the fact that of the four dimensions classroom focus is the easiest to make visible to classroom visitors.

An analysis of variance was also run on the statistical factors with the same results. The three groups are significantly different at the .01 level on Factor I (Application, Synthesis, Enthusiasm, and Independence) and Factor II (Memory and Test/Grade Stress). The gifted classes are superior to the average classes on both factors but there is no difference between the demonstration and reimbursement classes.

Are there patterns of emphasis within these four dimensions which characterize each sample of classes? The ensuing sections will look specifically at the sixteen factors within the four dimensions of the CAQ.

Patterns of Cognitive Emphasis

The first two dimensions of the CAQ, Lower and Higher Thought Processes, are composed of seven hierarchical levels of thinking based on Bloom's Taxonomy. Each higher numbered level includes the lower levels as part of the thinking operation. Thus all of the Higher Thought Processes (Application, Analysis, Synthesis, and Evaluation) utilize the Lower Thought Processes (Memory, Translation, Interpretation) in performing the thinking operation. The highest level, Evaluation, theoretically could call into

play all of the other six levels as subordinate processes in the act of evaluating. By way of illustration, if a student is expected to know a classification system for rock and mineral identification, memorizing is the end implied by the activity. However, if a student is given a bag full of rocks and minerals and is expected to identify them using the classification system, application is the end sought. Here memory or recall of the classification system serves as a means for efficiently identifying the rocks, but not as an end in itself.

What activities predominate in classrooms? In what percent of average classes or gifted classes are activities emphasized which call for each of the thinking processes? The CAQ provides only an indication -- a rough estimate -- of the focus of emphasis, but it is informative.[1]

Table 4 shows the patterns of emphasis which characterize each of the three groups of classes. Only those factors which were seen as emphasized (to any degree) by at least 25% of the classes in a group are considered to characterize a group. (Emphasis by fewer than 25% of the classes is not shown).

Average classes as a group emphasize three of the seven thought processes. The most common focus of emphasis is on Analysis -- breaking things apart into their structural components. (Remember that a particular class might have emphasized one of these levels, or two or three, or none. It might -- unlike the group as a whole -- have emphasized one or more of the other four levels, too.) It should be obvious from this pro-

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[1]Bear in mind that the lowest level, Memory, as noted by Steele , is not adequately assessed by the CAQ. Activities requiring rote memory rather than those calling for recall or recognition seems to be assessed. Drill and repetitive exercises are activities not fully reflected in the factor as presently structured.

TABLE 4

CHARACTERISTIC PATTERNS OF COGNITIVE EMPHASIS IN AVERAGE AND GIFTED CLASSES

	Cognitive Levels	% of Classes in Each Group Emphasizing Each Level: Sample of Average Classes (N=69)	Sample of Gifted Reimbursement Classes (N=28)	Sample of Gifted Demonstration Classes (N=34)
LOWER THOUGHT PROCESSES	1. Memory	--	--	--
	2. Translation	39%	57%	47%
	3. Interpretation	30%	64%	82%
HIGHER THOUGHT PROCESSES	4. Application	--	43%	59%
	5. Analysis	58%	90%	74%
	6. Synthesis	--	43%	39%
	7. Evaluation	--	25%	35%

file that many average classes place little or no emphasis on any cognitive level.

Both Reimbursement and Demonstration Gifted Classes are seen as emphasizing six of the seven cognitive levels -- twice as many as the Average classes. A greater proportion of classes emphasize each level in the Gifted group. In fact, a majority of the gifted classes emphasize three of the seven levels. The pattern of emphasis differs slightly between the Reimbursement and Demonstration groups. There is a shift upward in Demonstration classes toward greater emphasis on higher thought processes. A majority of Reimbursement classes emphasize levels 2, 3, and 5 (Translation, Interpretation and Analysis). A majority of the Demonstration classes emphasize levels 3, 4, and 5 (Interpretation, Application, and Analysis).

Varieties of Cognitive Emphasis

The characteristic patterns of emphasis in Average and Gifted classes indicate that as a group a greater proportion of Gifted classes emphasize a wider variety of cognitive levels than the Average group of classes. But what variety of emphasis occurs in individual classes? Are several levels of thinking emphasized in the same classroom? It would seem appropriate for gifted classes to emphasize a greater variety of thought processes than average classes, as well as emphasizing several of the higher levels of thinking. Table 5 shows the number (not the level) of thought processes emphasized in classrooms in each group.

TABLE 5

TOTAL NUMBER OF THOUGHT PROCESSES EMPHASIZED IN AVERAGE AND GIFTED CLASSROOMS

	% of Classes Emphasizing Each Number of Thought Processes		
Number of Thought Processes Emphasized By Individual Classes	Sample of Average Classes (N=69)	Sample of Gifted Reimbursement Classes (N=28)	Sample of Gifted Demonstration Classes (N=34)
None Emphasized	13%	--	--
1*	35%	11%	9%
2	25%	21%	21%
3	19%	25%	23%
4	7%	21%	26%
5	1%	18%	12%
6	--	4%	9%
7	--	--	--

*These numbers do not correspond to the levels of thinking, but only reflect how many thought processes are emphasized by individual classes.

The table shows that while only 8% of the Average classes emphasize four or more thought processes, 43% of the Gifted Reimbursement classes and 47% of the Gifted Demonstration classes emphasize four to six processes. The converse is also true: 48% of the Average classes emphasize one or no thought processes while only 9% and 11% of the two Gifted groups of classes emphasize as few as one or no levels of thinking.

Table 6 shows the number of Higher Thought Processes emphasized in Average and Gifted classes.

TABLE 6

NUMBER OF HIGHER THOUGHT PROCESSES EMPHASIZED IN AVERAGE AND GIFTED SAMPLES

Number of Higher Thought Processes Emphasized By Individual Classes	Sample of Average Classes (N=69)	Sample of Gifted Reimbursement Classes (N=28)	Sample of Gifted Demonstration Classes (N=34)
None Emphasized	28%	4%	6%
1	54%	29%	26%
2	16%	39%	32%
3	1%	21%	21%
4	1%	7%	15%

It can be seen that while only 18% of the Average classes emphasized more than one Higher Thought Process, 67-68% of the two Gifted groups emphasized more than one.

Thus it is clear that individual Gifted classes emphasize many levels of thinking including several higher thought processes. While this variety of emphasis would seem a beneficial instructional climate in any classroom, it seems especially appropriate for the gifted.

Patterns of Emphasis on Noncognitive Classroom Conditions

The third and fourth dimensions of the CAQ are Classroom Focus and Classroom Climate. Classroom Focus is concerned with the center of attention and activity -- on the teacher or the students. Classroom Climate is concerned with the openness of the classroom -- the existence of opportunities and conditions which are motivating and conducive to learning.

Table 7 shows the pattern of emphasis which characterize each of the three groups of classes. Again, only those factors which were seen as emphasized by at least 25% of the classes in a group are shown.

TABLE 7

CHARACTERISTIC PATTERNS OF EMPHASIS ON CLASSROOM FOCUS AND CLIMATE IN AVERAGE AND GIFTED CLASSES

	Classroom Conditions (Factors from the Class Activities Questionnaire)	% of Classes in Each Group Emphasizing Each Factor		
		Sample of Average Classes (N=69)	Sample of Gifted Reimbursement Classes (N=28)	Sample of Gifted Demonstration Classes (N=34)
CLASSROOM FOCUS	8. Discussion	30%	89%	88%
	9. Test/Grade Stress	25%	--	--
	10. Lecture	28%	32%	--
CLASSROOM CLIMATE	11. Enthusiasm	--	65%	70%
	(Lack of)	(51%)	(--)	(--)
	12. Independence	28%	71%	79%
	13. Divergence	69%	96%	97%
	(Much Emphasis)	(--)	(71%)	(82%)
	14. Presence of Humor	78%	93%	85%

In the Average Sample about as many classes (one-fourth of the group) seem to emphasize Lecture as emphasize Discussion. As the next table which deals with amount of teacher talk will show, however, the opportunity for discussion is limited due to the amount of teacher talk which occurs. The classroom focus in Average classes seems clearly on the teacher as information-giver, with a limited amount of active involvement of students. As a group Average classes are also characterized by stress on tests and grades.

In the Classroom Climate dimension, the most striking characteristic of Average classes is the lack of enthusiasm. In less than 25% of the classes are students excited and involved. On the contrary, in over half the Average classes students are not just neutral but negative and uninterested in class activities. As a group Average classes permit some opportunity for independence and divergence, however a very high degree of opportunity for divergent activities is not characteristic of Average classes. The presence of humor and laughter is characteristic of all three groups of classes studied.

In contrast to the Average group, almost all classes in the two Gifted groups emphasize discussion. Gifted students have opportunity and are involved in discussion. An emphasis on tests and grades is not characteristic of gifted classes. For the Reimbursement Gifted classes, lecture is still a characteristic of Classroom Focus in addition to the strong emphasis on discussion.

Both groups of Gifted classes are characterized by an extremely positive Classroom Climate. In a majority of the gifted classes students are excited and involved in class activities. There is opportunity for independent activities and <u>much</u> opportunity for divergent activities. As was true in the Cognitive dimensions a greater <u>proportion</u> of the classes in the Gifted groups emphasized positive classroom focus and classroom climate than Average classes.

Teacher Talk

The percentage of class time consumed by the teacher speaking is in itself an index of classroom conditions. The more teacher talk, the more passive a role of the student has in class activities. As was pointed out in an earlier section, students are extremely accurate in making this estimate. Table 8 shows the range of teacher talk in Average and Gifted classes. Note the extremes of High and Low amounts of talk.

The mode in Average classes is teacher talk 75% of class time; it is 60% in the two Gifted groups. However, the teacher talks less than half the time in 1/9 (12%) of the Average classes, 1/5 (21%) of the Gifted Reimbursement classes, and 1/3 (35%) of the Gifted Demonstration classes.

TABLE 8

PERCENTAGE OF CLASSES WITH HIGH TO LOW AMOUNTS OF TEACHER TALK

(Based on the median student estimate of teacher talk per class.)

Teacher Talk During Class Time	Percentage of Classes in Each Group		
	Average	Reimbursement	Demonstration
High (75-90% teacher talk)	55%	43%	6%
60%	33%	36%	59%
40%	9%	7%	14%
Low (10-25% teacher talk)	3%	14%	21%
	100%	100%	100%
	(N=69)	(N=28)	(N=34)

There is a dramatic decrease in teacher talk from Average to Gifted Demonstration classes. The percentage of classes in which an extremely low amount of teacher talk prevails increases sharply from Average to Demonstration classes.

Preparation for Class

Students estimated the amount of time each week they spent preparing for class. Bear in mind that their estimate concerns only one of five to seven or more subjects for which homework could be expected. Some of the preparation might be voluntary instead of required work. Table 9 shows the amount of time spent preparing for class weekly for Average and Gifted classes.

TABLE 9

TIME SPENT PREPARING FOR CLASS EACH WEEK IN AVERAGE AND GIFTED CLASSES

(Based on the median student estimate for each class.)

Hours of Preparation Time Each Week	Sample of Average Classes (N=69)	Sample of Gifted Reimbursement Classes (N=28)	Sample of Gifted Demonstration Classes (N=34)
Less than 1 hour	10%	0%	35%
From 1 to 2 hours	67%	43%	44%
More than 2 hours	23%	57%	21%

It can be noted in the Table that students in a large proportion of classes in all three groups spend from 1 to 2 hours per week on homework of some kind. This is somewhat less than one-half hour each evening. The two Gifted groups show some variation from this pattern, but in opposite directions. The majority of students in Gifted Reimbursement classes spend more than 2 hours a week preparing for class. Gifted Demonstration students in over one-third of the classes spend less than one hour per week on outside preparation. It is difficult to account for this difference without information on the nature of outside-of-class activities.

Summary

Based on the Class Activities Questionnaire, significant differences are found between Average and Gifted Illinois classes in the degree of emphasis on higher thought processes, classroom focus, and classroom climate. Significant differences are also noted between Average and Gifted classes on the statistical factors of "Application, Synthesis, Enthusiasm, and Independence" and "Memory and Test/Grade Stress."

Specifically the following differences are noted:

Average Classes	Gifted Classes
1. Most classes emphasize few (2 or less) thought processes.	1. Most classes emphasize many (3 or more) thought processes.
2. Most classes emphasize only one (if any) of the higher thought processes.	2. Most classes emphasize two or more of the higher thought processes.
3. As a group, Average classes emphasize 3 of the 7 levels of thinking: Translation, Interpretation, Analysis.	3. As a group, Gifted classes emphasize 6 of the 7 levels of thinking.
4. A higher amount of teacher talk occurs.	4. A moderate amount of teacher talk occurs.
5. Classes have little opportunity for or involvement in discussion.	5. Classes have much opportunity for and involvement in discussion.
6. Test/grade stress is characteristic of Average classes as a group.	6. Test/grade stress is not characteristic of Gifted classes as a group.
7. There is an absence of enthusiasm in a majority of the classes.	7. The presence of enthusiasm characterizes almost all classes.
8. There is opportunity for independence in a fourth of the classes.	8. There is opportunity for independence in most Gifted classes.